IN THE CLAIMS

Please amend the claims as indicated below.

1. (currently amended) A method for generating a pulsed excitation function representative of a human vocal tract, comprising:

receiving movement information of at least one tissue type associated with human voicing activity, wherein the movement information comprises position versus time information, wherein the at least one tissue type includes human vocal tract tissue that vibrates with opening and closing of vocal folds;

generating pressure-related information using at least one derivative of the movement information;

identifying opening times and closing times of the vocal folds using the pressure-related information;

constructing the pulsed excitation function by generating a curve including ~~negative amplitude~~ pulses at times corresponding to the closing times of the vocal folds and ~~positive amplitude~~ opposite polarity pulses at times corresponding to the opening times of the vocal folds; and

adjusting amplitudes and widths of the ~~negative amplitude and positive amplitude~~ opening and closing pulses to match speech output of the human vocal tract.

2. (currently amended) The method of claim 1, further comprising:

determining parameters of the human vocal tract tissue by applying a simple harmonic oscillator model to the constructed pulsed excitation function, wherein the parameters include mass, elasticity, and damping; and

constructing a model of the human vocal tract tissue using the parameters.

3. (currently amended) The method of claim 1, further comprising determining voiced speech parameters using the constructed pulsed excitation function, wherein the human speech parameters include voiced excitation functions, voicing states, pitch periods,

vocal tract transfer functions, ~~and~~ tracheal wall parameters, and the pressure-related information.

4. (new) The method of claim 2, further comprising using an adaptive algorithm to select optimal values for pulse amplitude and width parameters, and parameters of the simple harmonic oscillator model.

5. (new) The method of claim 1, further comprising:

receiving a signal representative of movement of a human vocal tract, including a glottal-area electromagnetic micropower sensor (GEMS) signal;

generating at least one of a first derivative and a second derivative of the GEMS signal;

identifying all peaks of the first derivative and zero crossings of the second derivative of the GEMS signal;

determining pulse locations using at least one of the peaks and zero crossings.

6. (new) The method of claim 5, further comprising placing pulses having a desired amplitude and width at the determined pulse points.

7. (new) The method of claim 6, wherein the desired amplitude and width are determined using at least one process selected from a group comprising, trial and error processes, and adaptive processes.

8. (new) The method of claim 1, further comprising determining parameters of the human vocal tract tissue, including:

applying a mathematical model to the pulsed excitation function, wherein the mathematical model comprises at least a simple harmonic oscillator model, to generate an output signal that simulates the movement of the human vocal tract during speech production;

comparing the output of the mathematical model to the original signal representative of movement of a human vocal tract used to calculate the pulsed excitation function;

generating corrected parameters using at least one of a trial and error method and an adaptive function that utilizes the output of the mathematical model and the original signal representative of movement of a human vocal tract used to calculate the pulsed excitation function.

9. (new) A system for calculating a plurality of human speech parameters, comprising:

a plurality of microphones;

at least one sensor for detecting movement information of at least one tissue type associated with human voicing activity; and

a processor coupled to the plurality of microphones and to the at least one sensor, wherein the processor is configured to execute a plurality of algorithms including at least one algorithm for generating a pulsed excitation function, wherein generating the pulsed excitation function comprises,

generating pressure-related information using at least one derivative of the movement information;

identifying opening times and closing times of the vocal folds using the pressure-related information; and

constructing the pulsed excitation function by generating a curve including folds-closing pulses at times corresponding to the closing times and opposite polarity folds-opening pulses at times corresponding to the opening times.

10. (new) The system of claim 9, wherein at least one algorithm further comprises a noise suppression algorithm and a speech feature extraction algorithm.

11. (new) The system of claim 9, wherein generating the pulsed excitation function further comprises adjusting amplitudes and widths of the folds-closing and folds-opening pulses to match speech output of the human vocal tract.

12. (new) The system of claim 9, wherein the movement information comprises position versus time information, wherein the at least one tissue type includes human tissue that vibrates with opening and closing of vocal folds, and wherein the movement can in include vocal fold movement.

13. (new) The method of claim 9, wherein the processor is further configured to:

determine human vocal tract tissue parameters by applying a simple harmonic oscillator model to the constructed pulsed excitation function, wherein the parameters include mass, elasticity, and damping; and

construct a model of the human vocal tract tissue using the parameters.

14. (new) The method of claim 1, wherein the human speech parameters include voiced excitation functions, voicing states, pitch periods, vocal tract transfer functions, the pressure-related information, and tracheal wall parameters.

15. (new) A computer-readable medium having instruction stored thereon, which when executed, cause a processor to calculate a plurality of human speech parameters, wherein calculating comprises:

receiving movement information of at least one tissue type associated with human voicing activity, wherein the movement information comprises position versus time information, wherein the at least one tissue type includes human tissue that vibrates with opening and closing of vocal folds;

generating pressure-related information using at least one derivative of the movement information;

identifying opening times and closing times of the vocal folds using the pressure-related information;

constructing the pulsed excitation function by generating a curve including folds-closing pulses at times corresponding to the closing times and opposite polarity folds-opening pulses at times corresponding to the opening times; and

adjusting amplitudes and widths of the folds-closing and folds-opening pulses to match speech output of the human vocal tract.

16. (new) The computer-readable medium of claim 15, wherein calculating the plurality of human speech parameters further includes calculating a transfer function of the vocal tract using at least one of the pulsed excitation function, the pulsed excitation function as filtered by a simple harmonic oscillator model of a vocal tract, and a glottal-area electromagnetic micropower sensor (GEMS) signal as input, and recorded audio as output of a vocal tract model.

17. (new) The computer-readable medium of claim 15, wherein calculating the plurality of human speech parameters further includes:

determining parameters of the human vocal tract by applying a simple harmonic oscillator model to the constructed pulsed excitation function, wherein the parameters include mass, elasticity, and damping; and

constructing a model of the human vocal tract using the parameters.

18. (new) The computer-readable medium of claim 15, wherein calculating the plurality of human speech parameters further includes determining voiced speech parameters using the constructed pulsed excitation function, wherein the human speech parameters include voiced excitation functions, voicing states, pitch periods, vocal tract transfer functions, the pressure-related information, and tracheal wall parameters.

19. (new) The computer-readable medium of claim 17, wherein calculating the plurality of human speech parameters further includes using an adaptive algorithm to select optimal values for pulse amplitude and width parameters, and parameters of the simple harmonic oscillator model.

20. (new) The computer-readable medium of claim 15, wherein calculating the plurality of human speech parameters further includes:

receiving glottal-area electromagnetic micropower sensor (GEMS) signal;

generating at least one of a first derivative and a second derivative of the GEMS signal;

identifying all zero crossings of a raised version of the GEMS signal;

determining pulse locations using the zero crossings.

21. (new) The computer-readable medium of claim 20, wherein calculating the plurality of human speech parameters further includes placing pulses having a desired amplitude and width at the determined pulse points.

22. (new) The computer-readable medium of claim 21, wherein the desired amplitude and width are determined using at least one process selected from a group comprising, trial and error processes, and adaptive processes.

23. (new) The computer-readable medium of claim 15, wherein calculating the plurality of human speech parameters further includes determining parameters of the human vocal tract, including:

applying a mathematical model to the pulsed excitation function, wherein the mathematical model comprises at least a simple harmonic oscillator model, to generate an output signal that simulates the movement of the human vocal tract during speech production;

comparing the output of the mathematical model to the original signal representative of movement of a human vocal tract used to calculate the pulsed excitation function;

generating corrected parameters using at least one of a trial and error method and an adaptive function that utilizes the output of the mathematical model and the original signal representative of movement of a human vocal tract used to calculate the pulsed excitation function.